Who goes first?
What cues do drivers rely on to evaluate a pedestrian's intention at an intersection?

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Introduction

- We rely on cues provided by body language and facial expressions to navigate social interactions
- There is little research on how these cues influence interactions between pedestrians and drivers at intersections
- Eye-tracking data allows better understanding of how drivers detect and evaluate pedestrians
- Hypothesis
  - Participants believe it is safe to proceed if the pedestrian is perceived to be aware of the car

Method

Participants

- 10 university students (2 males, 8 females)
  - Age:
    - 19 – 43 yrs old (μ = 24.2 yrs; SD = 6.94 yrs)
  - Driving experience:
    - 0.5 – 27 yrs (μ = 8.2 yrs; SD = 7.17 yrs)

Procedure

- Vision Screening
  - Acuity test: Snellen Eye Chart
  - Color Vision Test: Ishihara Test
- Calibrated to Tobii 2 Pro Eye Tracking Glasses
- Participants given scenario asking them to imagine they were driving a car and to evaluate whether it was safe to proceed through the intersection
- Participants watched 18 driving videos, some contained pedestrians with different characteristics:
  - Body position (facing toward or away from the road)
  - Actions (walking or standing)
  - Eye contact or no eye contact
- After each video, participants were asked:
  1. If it was safe to continue driving straight
  2. If there was a pedestrian in the scene
  3. Their confidence rating the pedestrian's awareness of the car
- Demographics survey
  - Acquired gender, age, and driving experience

Figure 1: The left image is an example of a participant calibrated to the eye-tracking glasses, right shows the lab set-up

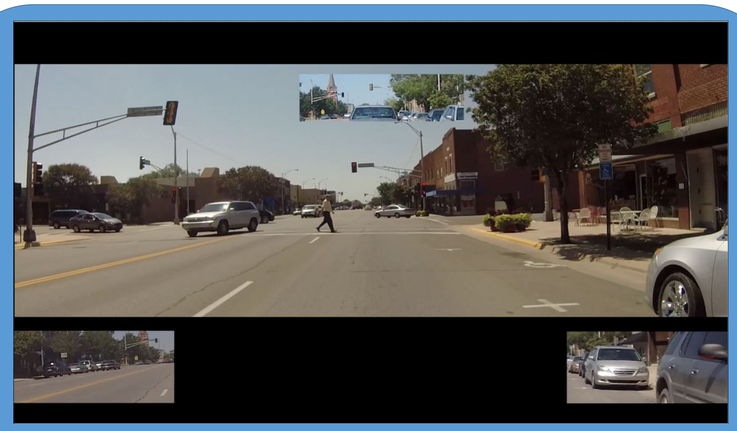

Figure 2: This is a scene from one of the driving videos. The bottom sections show the left and right rear view mirrors.

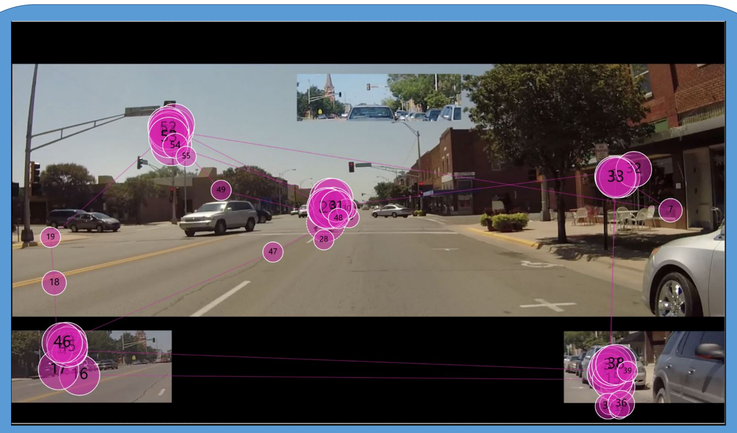

Figure 3: Gaze pattern of a participant viewing the driving scene

Next Steps

Data Analysis

- Import eye-tracking recordings into Tobii software
- Define pedestrians as Areas of Interest (AOIs) for each participant's eye-tracking recording
- Analyze collected data (Table 1)

Table 1.
Data logged during study

Data source	Parameter
Eye-tracking	Time to first fixation (AOI) Visit count (AOI) Total fixation duration (AOI) Fixation count (AOI)
Questions	Q1 – safe or unsafe Q2 – pedestrian detection Q3 – awareness rating

Results

Results will show how participants' judgments of "safe or unsafe" to proceed are related to a pedestrian's body position (facing toward or away from the road), actions (walking or standing), and eye contact.

References

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